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(54) **METALLIC STRUCTURES HAVING POROUS REGIONS FROM IMAGED BONE AT PRE-DEFINED ANATOMIC LOCATIONS**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,047,395 A 9/1991 Wu
5,639,402 A 6/1997 Barlow et al.
(Continued)

FOREIGN PATENT DOCUMENTS

EP 2874570 B1 1/2017
WO WO-2012154534 A1 11/2012

OTHER PUBLICATIONS

International Preliminary Report on Patentability for International Application No. PCT/US2013/046711, dated Jan. 29, 2015 (11 pages).

(Continued)

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(57) **ABSTRACT**

An additively manufactured medical implant, comprising a metallic body having at least one porous surface configured to promote bony on-growth or in-growth of tissue, the porous surface being replicated from a high resolution scan of bone, and a biological surface coating configured to create a barrier to particulate debris, the biological surface coating being produced from a titanium porous plasma spray surface coating or a biomimetic coating.

15 Claims, 6 Drawing Sheets

